
Claims:

1. (Amended in Preliminary Amendment, Withdrawn from Consideration) A bone boring device, comprising:

a needle base;

a pivot; at least one curved needle having a tip at one end thereof and rotatably mounted on the needle base, said needle and pivot arranged and adapted so that when said tip is placed against bone tissue and said needle is rotated around said pivot, said needle is urged into said bone.

2. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 1, wherein said pivot comprises a rotary hinge coupled to said needle base.

3. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 1, comprising a resting point adjacent said pivot and on an outside of said device, which resting point is adapted to be placed against said bone.

4. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 1, wherein said curved needle has a radius of curvature matching a distance of said needle from said pivot.

5. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 1, comprising:

at least one drill bit for drilling into said bone and defining a channel formed therethrough; and return an aperture from the outside of said bit to said channel, wherein said at least one needle is adapted to fit through said aperture.

6. (Withdrawn from Consideration) A device according to claim 5, wherein said drill comprises a bone drill, adapted to drill through a cortex portion of said bone.

7. (Withdrawn from Consideration) A device according to claim 5, wherein said at least one needle is not suitable for boring through a cortex portion of said bone.

8. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 5, wherein said at least one drill bit comprises two drill bits.

9. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 5, wherein said at least one drill bit comprises a single drill bit.

10. (Withdrawn from Consideration) A device according to claim 8, wherein said drill bits are positioned substantially parallel to each other.

11. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 8, wherein said drill bits rotate in a same direction.

12. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 8, wherein said drill bits rotate in opposite directions.

13. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 8, wherein said at least one needle comprises at least two needles.

14. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 8, wherein said at least one needle comprises a single needle.

15. (Withdrawn from Consideration) A device according to claim 14, wherein said at least one needle, said channel, said aperture and said drill bits are arranged and adapted such that said at least one needle can pass through said channel in said at least one of said two drill bits, exit through said aperture and meet a second one of said two drill bits.

16. (Withdrawn from Consideration) A device according to claim 15, wherein said second drill bit defines a receiving aperture in its side and wherein said needle meets said

second drill bit at said receiving aperture.

17. (Withdrawn from Consideration) A device according to claim 16, wherein said at least one needle comprises a detachable tip and wherein said receiving aperture is adapted to engage said detachable tip.

18. (Withdrawn from Consideration) A device according to claim 17, wherein said receiving aperture comprises a narrowing of said aperture radially inside of a volume defined by said second drill bit.

19. (Withdrawn from Consideration) A device according to claim 18, wherein said detachable tip is adapted to rotate inside said drill bit after said engagement, to lie within said volume.

PS 20. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 17, wherein said second drill bit defines an axial groove adjacent a drilling tip thereof, of a size sufficient for receiving a thread attached to said detachable tip.

21. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 8, wherein said aperture is formed in a side of said drill bit.

22. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 1, comprising a motor for rotating said drill bits.

23. (Deleted)

24. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to 22, wherein said motor is a stepper motor adjusted to rotate said drill bits only whole numbers of rotations.

25. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to 22, comprising a mechanical stop for stopping said drill bits so that they are angularly aligned.

26. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to 22, comprising a sensor for detecting an angular position of at least one of said drill bits and comprising a controller for controlling said motor responsive to input from said sensor.

27. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 1, wherein said at least one needle comprises a first needle and a second needle.

28. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 13, wherein said needles rotate about a same pivot for urging into said bone.

29. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 13, wherein said needles do not share a common hinge.

30. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 13, wherein said needles are adapted to meet at their ends, when said needles are rotated around said pivot.

31. (Withdrawn from Consideration) A device according to claim 30, wherein said needles meet tip-to-tip.

32. (Withdrawn from Consideration) A device according to claim 30, wherein said needles meet side-to-side, at their ends.

33. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 13, wherein said needles are formed with a conduit and wherein, when said needles meet, a continuous conduit is formed along the needles.

34. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 30, wherein said first needle is adapted to engage a tip of said second needle.

35. (Withdrawn from Consideration) A device according to claim 34, wherein said second needle is hollow, defining a conduit therethrough.

36. (Withdrawn from Consideration) A device according to claim 34, wherein said second needle has a groove defined along most of its length, describing a conduit.

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37. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 33 and comprising a channel substantially contiguous with said conduit and adapted for advancing a thread through said channel and along said conduit.

38. (Withdrawn from Consideration) A device according to claim 37, comprising a thread pusher for advancing thread through said conduit and said channel.

39. (Withdrawn from Consideration) A device according to claim 38, wherein said thread pusher is long enough to extend through said channel and said conduit to outside said device.

40. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 34, wherein said tip comprises a detachable tip to which the thread is attached.

41. (Withdrawn from Consideration) A device according to claim 40, wherein said detachable tip comprises an extension to which a thread is attached, which extension is

substantially longer than said second needle.

42. (Withdrawn from Consideration) A device according to claim 34, wherein said second needle is detachable from said needle base.

43. (Withdrawn from Consideration) A device according to claim 42, wherein said needles meeting causes said second needle to detach.

44. (Withdrawn from Consideration) A device according to claim 43, wherein said second needle is adapted for attaching a thread thereto.

45. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 34, wherein said first needle defines an aperture at its tip, which aperture is adapted to engage said tip of said second needle.

46. (Withdrawn from Consideration) A device according to claim 45, wherein said aperture is an opening to a blind hole.

47. (Withdrawn from Consideration) A device according to claim 45, wherein said aperture is an opening to a through hole which exists through a side in said needle.

48. (Withdrawn from Consideration) A device according to claim 45, wherein said aperture connects to a hollow volume along an axis of said needle.

49. (Withdrawn from Consideration) A device according to claim 48, comprising a sharp-tip mandrel that fills said hollow volume, for at least part of a rotation of said needle around said pivot.


50. (Withdrawn from Consideration) A device according to claim 49, wherein said mandrel is retracted when said needles meet.

51. (Withdrawn from Consideration) A device according to claim 45, wherein said aperture connects to a hollow volume having an axis oblique to an axis of said needle.

52. (Withdrawn from Consideration) A device according to claim 45, wherein said aperture is an opening to a volume extending into said needle and having a substantially constant inner diameter.

53. (Withdrawn from Consideration) A device according to claim 45, wherein said aperture is an opening to a volume extending into said needle and having an inner diameter that increases away from the aperture.

54. (Withdrawn from Consideration) A device according to claim 45, wherein said aperture is an opening to a slotted volume.

 55. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 1, wherein said device comprises a handle.

56. (Withdrawn from Consideration) A device according to claim 55, wherein said needles and said hinge are comprised in a disposable cartridge, separable from said handle.

57. (Withdrawn from Consideration) A bone boring device, comprising:
at least one needle adapted for boring into bone;
a force providing element, remote from said needle, for advancing said needle;
and
a force amplifier, coupled to said needle and adjacent to said needle which amplifies force provided from said force providing element and supplies it to said needle.

58. (Withdrawn from Consideration) A device according to claim 57, wherein said at least one needle comprises two needles.

59. (Withdrawn from Consideration) A device according to claim 57, wherein said needle is mounted on a hinge and wherein said needle is rotated around said hinge by force provided by said force amplifier.

60. (Withdrawn from Consideration) A device according to claim 57, wherein said force amplifier comprises a lever.

61. (Withdrawn from Consideration) A bone-boring device, comprising:
at least one curved needle adapted for extending to bore a hole in a bone;
a base holding said needle and including a portion on an outside of said device, which portion is adapted for being placed against a bone;
a handle coupled to the base; and
a needle retractor, which retracts said needle when a force on said handle in a particular direction is lower than a predetermined amount, prior to said base retreating from said bone in response to a lowering of the force.

62. (Amended in Preliminary Amendment, Withdrawn from Consideration) A bone-boring device, comprising:
at least one curved needle adapted for extending to bore a hole in a bone;
a base holding said needle and adapted for being placed against a bone;
a handle coupled to the base; and
a needle advancer, which advances said needle only when a force on said handle in a particular direction is higher than a predetermined amount, said predetermined force assuring that said base is urged against said bone.

63. (Amended) A detachable tip for a needle, comprising:
a tip having a sharp end and adapted for boring through a bone; [[and]]
a flexible extension of said tip, opposite of said sharp end and substantially longer than said sharp tip, attached to a thread, and

wherein said tip is adapted for being grasped by a nonsolid needle, at a side of the extension.


64. Please cancel claim 64.

65. (Amended) A detachable tip [[according to claim 63,]] for a needle, comprising:

a tip having a sharp end and adapted for boring through a bone;

a flexible extension of said tip, opposite of said sharp end and substantially longer than said sharp tip, attached to a thread, and

wherein said sharp end is adapted for being grasped by a hollow needle, at a side of the sharp tip opposite of the extension.

 66. (Withdrawn from Consideration) A self-aligning device for boring into bone, comprising:

a boring head having at least two boring tips;

a body; and

a hinge coupling said head to said body at a location substantially equidistant from said boring tips.

67. (Withdrawn from Consideration) A device according to claim 66, wherein said boring tips comprise drill bits.

68. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 66, wherein said boring tips comprise boring needles.

69. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 66, wherein said head includes a power source for activating said boring tips.

70. (Withdrawn from Consideration) A device according to claim 66, wherein said boring tips face said handle.

71. (Withdrawn from Consideration) A method for forming a channel in a bone, comprising:

drilling two holes in a cortex of the bone; and advancing at least one needle through said drilled holes through a medulla of said bone.

72. (Withdrawn from Consideration) A method according to claim 71, wherein said holes are perpendicular to a surface of said bone.

73. (Withdrawn from Consideration) A method according to claim 71, wherein said at least one needle comprises two 15 needles that meet inside the bone.

Bg 74. (Withdrawn from Consideration) A bone boring device, comprising: at least one bone-drilling drill bit defining a needle path therein; and at least one needle adapted to travel along said needle path.

75. (Withdrawn from Consideration) A device according to claim 74, wherein said needle path comprises a lumen.

76. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 74, comprising a needle base and a pivot, wherein said at least one needle has a tip at one end thereof and is rotatably mounted on the needle base, said needle and pivot arranged and adapted so that when said tip is placed against bone tissue and said needle is rotated around said pivot, said needle is urged into said bone.

77. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 74, wherein said at least one needle comprises at least two needles.

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78. (Amended in Preliminary Amendment, Withdrawn from Consideration) A device according to claim 74, wherein said at least one drill bit comprises at least two drill bits.
